

Excerpts from EPA written comments to the Navy regarding buildings

Here is an excerpt from the 1/11/2017 EPA comments on the 1/5/2017 draft Radiological Data Evaluation Plan:

In the future, as the plans evolve, please address buildings. More specifically, on December 7, 2016, EPA gave the Navy an updated version of its detailed technical recommendations. On page 7, Recommendation 7 stated “The Navy should also address the elevated levels found in Buildings 271 and 406. . . . The Navy should address the implications of these findings for these and other buildings.” The calculations shown in the attachment raise questions about several areas of previous work conducted by Tetra Tech EC in buildings. Based on the information we have at this time, EPA would recommend some rescanning of buildings at the site. We therefore support the recommendations for rescanning from the State of California Department of Public Health (CDPH) letter in November, 2016. We understand that the Navy has chosen to evaluate buildings on a longer time frame and to focus on evaluating soil data first. When in the future more resources are available to study the buildings issue in more depth, we will look forward to revisiting this concern and reviewing any new information that may help us understand better any potential risks to public health and the environment related to buildings.

Here are excerpts from 12/5/2016 EPA recommendations to Navy. I handed hard copies out at the meeting at the Shipyard. These comments appear in both the full and the redacted versions.

Building scans: Though the scan speed of buildings was originally outside the scope of this effort, for completeness, the Navy should at least provide the following: 1) a summary explanation of the issue that includes verifying what scan speeds were achieved for each of the buildings and whether documented radiation survey procedures were followed to ensure the Minimum Detectable Concentrations (MDCs) were met, 2) work Navy has already conducted to address the issue, and 3) any further work that will be necessary to ensure that the cleanup is protective. The Navy should also provide a discussion of potential public exposure and health risk related to this issue.

The Navy should also address the elevated levels found in Buildings 271 and 406. It appears that levels found in Survey Unit 7 of Building 271 in the rescan should have been observed if prior scans had occurred at a speed of 8 approximately 8 cm/s or below. Previous scans appear to have been conducted at an average level of closer to approximately 2 to 3 cm/s. Details of these calculations appear in the attachment. Although reported results from the Final Status Survey Report showed many locations above these thresholds, no evidence of the beta static scans were observed. The Navy should address the implications of these findings for these and other buildings.

ATTACHMENT

A health physicist from EPA's contractor Techlaw, Inc., evaluated the Building 271 Survey Unit 7 data from the Final Status Survey Report and the rescan data provided in October 2016, from the Navy to estimate the average scan speed used in the previous work by Tetra Tech and the speed above which levels found in the rescan would have been missed.

Note that these estimates may not be based on the right input parameters, and the Navy has offered to provide factual information that may change the results.

Survey Unit 7 in Building 271 was used to perform calculations which indicate what the actual scan speed was. The target scan speed was 1.37 cm/second.

The detector used to scan for alpha/beta for Class 1 survey units on the floor was a gas proportional detector, Ludlum Model 43-37-1 with an active detector window size of 821 cm². From a review of the instrument specifications, the width of this detector is 15.9 cm in the direction of the scan, and 51.6 cm wide perpendicular to scan direction. Therefore, the width covered for each 'lane' of survey was approximately 51.6 cm.

From information provided in the Hunter's Point Final Status Survey Results, the Building 271 Survey Unit 7 (SU 7) included 71.90 m² and was investigated as a Class 1 Survey Unit, in accordance with guidance provided in the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM). SU 7 was divided into 1 large rectangle with dimensions of 10 m x 4.17 m = 40.17 m², and 2 smaller rectangles at 2 m x 4 m each, or a total of 4 m x 8 m = 32 m² to estimate the scan speed. Please note that this method provides an estimate only.

For the large rectangle, the room is 4.17m or 417 cm wide. The detector width is 51.6 cm, so $417/51.6 = 8$. This would require scanning 8 lanes at 1000 cm in length each. This would total 8,000 cm of floor space to be scanned.

For the two smaller rectangles, area was assumed to be 2 m x 8 m each for a combined floor space equaling 32 m² or 3200 cm² of floor space to be scanned. The width of each rectangle equaled 2 m (200 cm) for a total combined width of 400 cm. $400\text{cm}/51.6\text{ cm} = \text{approximately } 8$ lanes to be scanned at a length of 800 cm each. The total area to be scanned is calculated as 8 lanes x 800 cm = 6,400 cm of floor space.

$8000\text{ cm} + 6,400\text{ cm} = 14,400\text{ cm}$ of space to be scanned in total.

Using scan data/information obtained from the Hunter's Point_Final Status Survey Result Building 271_03.23.2012, from pdf page 363 of scan survey information for Survey Unit 7, the entire survey was conducted in 98 minutes, or 5,880 seconds. If the surveys was conducted without any pauses or stops, this would equate to a scan speed of $14,400\text{ cm}/5,880\text{ sec} = \text{approximately } 2.4\text{ cm/second}$.

In addition, we considered whether 496 measurements were sufficient to cover 71.90 square meters:

There are 719,000 cm² in survey unit 7 (71.90 m² x 10000 cm²/ m²) For 496 measurements, divide the total area by 496 to see if the number of measurements are consistent with the size of the instrument. The result of this calculation is 1449 cm²/measurement, which is larger than the instrument size of 821 cm²).

To check this, divide 719000 cm² by 821 cm² to see if they collected enough measurements. If the instrument is 821 cm² 875 measurements should have been collected to cover the entire survey unit, whereas there were only 496 measurements recorded for the Final Status Survey Results.

Both methods suggest that they did not collect a sufficient number of measurements because the scan speed was too high.

EPA's contractor health physicist would give more weight to the static measurements.

It is noted that the quality of the data could not be checked because daily and weekly source checks for determining the instrument background and efficiency were within tolerance limits was not provided. Therefore, evidence to support that the instruments were working properly was not available for review.

According to the Base-wide Plan Revision 1 (TtEC 2007), Scan speeds may be adjusted based, provided the probability of detecting contamination does not fall below 90%. This follows RASO guidance and we would agree with this assumption.

Given the assumption that the probability of detecting contamination for a given Ludlum 43-37-1 detector with a width of 15.9 cm, and a scan speed that must be achieved in order to obtain at least a 90% confidence, using the chart of probabilities included in the Addendum to Parcels B and G Radiological RACR on page 13 (Scan Speed vs probability), a scan speed of no faster than 8 cm/sec, with a scan time interval of 2 seconds would be needed to ensure the elevated areas of radioactivity are detected with a 90% confidence.